5. The BLM stack according to claim 1, wherein the metal second layer comprises a nitrided refractory metal or a nitrided metal alloy.

6. The BLM stack according to claim 1, wherein the metal second layer comprises a nitrided refractory metal or nitrided refractory metal alloy selected from Ni, Co, Pd, Pt, NiV, CoV, PdV, PtV, Ti, Zr, Hf, Cr, Mo, W, Sc, Y, La, and Ce in a solid-solution or stoichiometric ratio.

7. The BLM stack according to claim 1, further comprising:

an intermetallic zone disposed between the metal fourth layer and the electrically conductive bump.

8. The BLM stack according to claim 1, further comprising:

an intermetallic zone disposed between the metal fourth layer and the electrically conductive bump, wherein the intermetallic zone comprises a Sn-refractory metal composition.

9. The BLM stack according to claim 1, wherein the electrically conductive bump comprises a tin-lead solder composition.

10. The BLM stack according to claim 1, wherein the electrically conductive bump comprises a tin-lead solder composition selected from Sn37Pb, Sn97Pb, and Sn_xPb_y, wherein x+y total 1 and wherein x is in a range from about 0.3 to about 0.99.

11. A ball-limiting metallurgy (BLM) stack comprising:

a refractory metal first layer disposed over a metallization, wherein the refractory metal first layer is in a thickness range from about 500 to 2,000 length units;

a refractory metal second layer disposed over the refractory metal first layer, wherein the refractory metal second layer is in a thickness range from about from about 1,000 to about 4,000 of said length units;

a refractory metal third layer disposed over the refractory metal second layer, wherein the refractory metal third layer is in a thickness range from about from about 500 to 2,000 of said length units, and wherein the metal third layer is substantially the same composition as the refractory metal first layer;

a refractory metal fourth layer disposed over the refractory metal third layer, wherein the refractory metal fourth layer is in a thickness range from about from about 1,000 to about 4,000 of said length units, and wherein the refractory metal fourth layer is substantially the same composition as the refractory metal second layer; and

an electrically conductive bump disposed over the refractory metal fourth layer.

12. The BLM stack according to claim 11, wherein the refractory metal first and third layers comprise Ti.

13. The BLM stack according to claim 11, wherein the refractory metal first and third layers comprise Ti and the refractory metal first and third layers have a thickness of about 1,000 Å.

14. The BLM stack according to claim 11, wherein the refractory metal first and third layers comprise Ti and the refractory metal first and third layers each have a thickness of about 1,000 Å, and wherein the refractory metal second and fourth layers each have a thickness of about 2,000 Å.

15. The BLM stack according to claim 11, further comprising:

an intermetallic zone disposed between the metallization and the electrically conductive bump, wherein the intermetallic zone comprises a Sn-refractory metal composition.

16. The BLM stack according to claim B11, further comprising:

an intermetallic zone disposed between the metallization and the electrically connective bump.

17. A process comprising:

forming a metallization;

forming a refractory metal first layer over the metallization;

forming a refractory metal second layer over the refractory metal first layer;

forming a refractory metal third layer above and on the refractory metal second layer, wherein the third refractory metal is substantially the same metal as the refractory metal first layer;

forming a refractory metal fourth layer above and on the refractory metal third layer, wherein the refractory metal fourth layer is substantially the same metal as the refractory metal first layer; and

forming an electrically connective bump above the refractory metal fourth layer.

18. The process according to claim 17, wherein forming a metallization comprises:

forming a copper metallization pad over a substrate, wherein the copper metallization pad makes contact with a metallization selected from a range of metal-one (M1) to M6.

19. The process according to claim 17, wherein forming a refractory metal first layer over the metallization comprises:

depositing the refractory metal first layer by physical vapor deposition of a composition selected from Ni, Co, Pd, Pt, Ti, Zr, Hf, Cr, Mo, W, Sc, Y, La, and Ce.

20. The process according to claim 17, wherein forming a refractory metal first layer over the metallization comprises:

sputtering Ti over the metallization to a thickness in a range from about 500 Å to about 2,000 Å.

21. The process according to claim 17, wherein forming a refractory metal second layer over the refractory metal first layer comprises:

depositing the refractory metal second layer by physical vapor deposition of a composition selected from Ni, Co, Pd, Pt, NiV, CoV, PdV, PtV, Ti, Zr, Hf, Cr, Mo, W, Sc, Y, La, and Ce in a solid-solution or stoichiometric ratio.

22. The process according to claim 17, wherein forming a refractory metal second layer over the refractory metal first layer comprises:

sputtering NiV over the refractory metal first layer to a thickness in a range from about 1,000 Å to about 4,000 Å.

23. The process according to claim 17, wherein forming a refractory metal third layer over the metallization comprises:

depositing the refractory metal third layer by physical vapor deposition.

24. The process according to claim 17, wherein forming a refractory metal third layer over the metallization comprises:

sputtering NiV over the refractory metal second layer to a thickness in a range from about 500 Å to about 2,000 Å.

25. The process according to claim 17, wherein forming a refractory metal fourth layer over the refractory metal first layer comprises:

depositing the refractory metal fourth layer by physical vapor deposition.

26. The process according to claim 17, wherein forming a refractory metal fourth layer over the refractory metal first layer comprises:

sputtering NiV over the refractory metal third layer to a thickness in a range from about 1,000 Å to about 4,000 Å.

27. A process comprising:

forming a metallization;

sputtering a refractory metal first layer over the metallization;

sputtering a refractory metal second layer over the refractory metal first layer, wherein the refractory metal second layer is a refractory metal alloy;

sputtering a refractory metal third layer above and on the refractory metal second layer, wherein the third refractory metal is substantially the same metal as the refractory metal first layer;

sputtering a refractory metal fourth layer above and on the refractory metal third layer, wherein the refractory metal fourth layer is substantially the same metal as the refractory metal first layer; and

plating a Sn-containing solder through a mask onto the refractory metal fourth layer to form an electrically connective bump.

28. The process according to claim 27, further comprising:

etching the first-through-fourth refractory metal layers with an etch recipe that is selective to the solder; and

reflowing the solder.

29. The process according to claim 27, further comprising

first anisotropic etching the first-through-fourth refractory metal layers with an etch recipe that is selective to the solder;

second isotropic etching the first-through-fourth refractory metal layers with an etch recipe that is selective to the solder and to the mask; and

reflowing the solder.

30. The process according to claim 27, further comprising:

anisotropically etching the mask and the first-through-fourth refractory metal layers by using the bump precursor as a shadow mask; and

etching the first-through-fourth refractory metal layers with an etch recipe that is selective to the solder.